# From Passive to Active Learners: Using Audience Response Systems to Foster Motivation and Participation in the Classroom

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**Abstract** *Audience Response Systems (ARS) enable direct interaction between a speaker and the audience through live polling. Audience members simply use their electronic devices (e.g. smartphones, tablets or laptops) to answer a question the presenter poses, and the results are instantly available. They can be presented to everyone in real time. As such, ARS are particularly well-suited for use in the classroom as they offer a variety of ways to actively engage students in their learning, such as quizzes, brainstorming activities or sharing the results of group work. This paper describes how I integrate ARS tools into my teaching practice with students enrolled in the B.A. and M.A. English Studies programs at Chemnitz University of Technology. It shows different ways of using ARS for direct and immediate feedback, which helps to engage and motivate students. Furthermore, it details the students' feedback on using ARS in my classes. I hope this report serves as a source of ideas for other lecturers who are looking for ways to actively engage their students, as well as for researchers interested in feedback and student engagement.*

**Keywords** *Audience Response Systems (ARS); digital feedback methods; active learning; student engagement; blended learning*

## 1. Introduction

During the pandemic, most teaching took place online for quite some time. Consequently, lecturers had to find new and innovative ways of engaging their students in online classes due to the circumstances and the changed teaching context to which neither lecturers nor students felt prepared. Video conference tools opened new ways of engaging students, e.g. by including options for live polls or digital whiteboards. The significant advantage was that the answers and results could easily be stored and shared afterwards. Additionally, these ways of engaging students turned out to be quite successful; they motivated students to actively participate in class, even those who usually tend to be quieter in classroom settings.

But upon return to on-site teaching, I asked myself how this interaction and student engagement could be continued and secured. In this context, I learned about Audience Response Systems (ARS) and started to use them in my classes in various ways. They have become an integral part of my regular teaching. The result is a digitally enhanced classroom in which students are actively engaged in their learning and motivated to participate in classroom activities and discussions.

This teaching report outlines how I integrate Audience Response Systems in my classes. It starts with a brief introduction to ARS tools before touching on the importance of formative feedback in learning. Afterwards, it outlines different types of classroom activities to actively engage learners with the help of ARS before it turns to the feedback that I have collected from my students on using ARS in our classes.

## 2. Audience Response Systems and Formative Feedback

Through live polling, Audience Response Systems (ARS) facilitate direct interaction between presenters and their audience. Audience members can answer questions posed by the speaker simply by using their electronic devices (such as smartphones, tablets, or laptops). The results are immediately available and can be presented to everyone in real-time. As such, ARS tools enable different opportunities for formative feedback, making their application particularly valuable in the classroom. *Formative feedback* is feedback that is given for the purpose of learning[1] while the learning process is still taking place. It supports students' learning by showing them what aspects they have already understood and which areas to revisit. At the same time, it also serves as a good indicator for lecturers and teachers to see which intended learning outcomes the students have already achieved and where further attention is needed.

The research literature offers quite a few examples that illustrate how valuable the use of ARS tools in higher education is. Gokbulut (2020), for example, reports on the beneficial use of *Kahoot!* (https://kahoot.it) and *Mentimeter* (https://www.mentimeter.com) for prospective teachers. Similarly, Pichardo et al. (2021) report how *Mentimeter* helped engage students actively and promote their learning, while Åhman et al. (2021) demonstrate the advantages of using ARS, especially in STEM subjects.

Beyond *Kahoot!* and *Mentimeter*, many other ARS tools can be used in the classroom (see, e.g., Schluer 2022, pp. 160–161 or Brandhofer, 2018, for an overview). Further popular examples are *AhaSlides* (https://ahaslides.com), *Particify* (https://particify.de) or *Tweedback* (https://tweedback.de). Each tool has its strengths and weaknesses and offers different features[2].

For my teaching needs, an ARS tool should be user-friendly and have an intuitive interface. It would also be preferable to have a PowerPoint add-in for seamless integration of the ARS slide into my presentations. Additionally, it should support specific question types including live polling (for intros, check-ins, quizzes), word clouds (for collecting

1 The opposite of *formative feedback* is *summative feedback*, i.e. feedback *on* learning, which is typically given at the end of the learning process. Both terms have been coined by Scriven (1967).

2 For a comparative evaluation I recommend the list provided by Brandhofer (2018).

prior knowledge or brainstorming with buzz words), open-ended text (to manage students' ideas after group work and think-pair-share), and possibly brainstorming (similar to open-ended text but allows ranking of ideas through student input after collection). The different scenarios will be explained in more detail in the next section.

## 3. Classroom Applications for Audience Response Systems

As mentioned earlier, various opportunities exist for integrating ARS in the classroom to engage learners actively. This chapter outlines different contexts where I use ARS with my students enrolled in the B.A. and M.A. *English Studies* program at Chemnitz University of Technology (TU Chemnitz).

### 3.1. ARS-supported Check-ins at the Beginning of a Class

Check-ins at the beginning of a class offer an excellent opportunity to collect *feedback on how the students feel* at a given moment. This helps to further an understanding of their current state of mind and allows the lecturer to interpret students' actions and performance against this background. Furthermore, it opens the possibility of engaging in a discussion with the students on their current needs. In return, students feel seen and appreciated, which – drawing on the FEASP-approach[3] – helps to foster their motivation and thus contributes to a positive learning atmosphere. Another advantage is that it is a very quick activity that does not take up much time but seems to substantially affect the students, as seen from the student feedback discussed in section 4.

Many different types of check-ins can be realized with the help of ARS tools. Usually, I utilize the question type *poll* and either ask the students how they feel on a scale from 1=very low to 5=very good or offer pictures or GIFs while asking them which best reflects their current mood or best describes their current week, etc. I only recently asked my students which film title best described their past weekend (the answer options included *Fast and Furious*, *Hangover*, *Frozen* or *The Pursuit of Happiness*). The possible variations of this activity are endless.

### 3.2. Audience Response Systems for Collecting (Prior) Knowledge

Using ARS tools to collect and activate prior knowledge helps gather *feedback on what the students already know*. This can take place in the form of brainstorming activities (e.g. *How could VR be used in the context of learning languages?*[4]) or through asking association ques-

3 The abbreviation FEASP stands for Fear, Envy, Anger, Sympathy and Pleasure. According to this approach, teaching should take place in a way to reduce the negative emotions (i.e. fear, envy and anger) and promote positive emotion (i.e. sympathy and pleasure) in order to foster student motivation (cf. Astleitner, 2000).

4 Question asked in my course "E-Learning: learning English with corpora and other tools" (TU Chemnitz, Summer Term 2023).

tions (e.g. *What do you associate with "Intercultural and Digital English World-Wide"?*[5]). The results can serve as a basis for further activities or discussions in class and can also indicate the students' prior knowledge of a particular topic.

To collect and visualize students' responses, I normally use the question type *word cloud* when I expect keywords as answers, or the question type *open-ended* if I expect (one or several) sentences as answers. For both question types, it is usually possible to enable multiple submissions per user. Depending on the ARS tool chosen, it may be possible to hide the results while students are still responding. This bears the advantage that a student's reply will not be influenced by what the others in the class have already posted. Once the students have submitted their ideas, the results can be revealed to the whole course for further discussion.

## 3.3. Audience Response Systems for Constructing Knowledge

Audience Response Systems can also be used to facilitate the construction of knowledge in the classroom by giving *feedback on what the students think and create*. For this purpose, ARS can be used to support so-called Think-Pair-Share activities (cf. Lyman, 1987). Students are asked to take a few moments to reflect on a question (e.g. *What are opportunities and challenges of e-learning?*[6] – *Think*), and then, they are asked to exchange and discuss their ideas with their partners (*Pair*). Lastly, they are supposed to collect their ideas in a few bullet points or keywords through the ARS tool (*Share*).

Similar to using ARS to collect prior knowledge outlined above, the question types *open-ended* or *word cloud* are suitable for this activity. The substantial advantage over traditional, non-ARS-supported Think-Pair-Share is that the students' ideas and thoughts are all visualized in the classroom and can directly be addressed by either the lecturer or the students for further discussion (e.g. Lecturer: *This is an interesting aspect. Who put this on the slide? Could you elaborate this idea for us?*). In this sense, it takes away a hurdle for quieter students who tend to shy away from sharing their ideas in class. They already received positive feedback on their answer from their peer in the activity as well as from the lecturer (*This is an interesting idea*) and may thus be more encouraged to explain it to the rest of the class. Secondly, using the ARS tool, all student replies can later be saved and exported for further use. This way, none of the students' ideas is lost, even if not all aspects mentioned on the slide are discussed in class.

Similarly, ARS tools can be used to support group work by collecting, visualizing and presenting students' opinions and findings. Since this type of activity usually yields results which cannot be displayed with keywords alone, the question types *open-ended* or *brainstorming* proved suitable in this context. In analogy to Think-Pair-Share activities, students are asked to record their results and ideas from the group work via the ARS tool. To be able to relate responses to individual groups, it is a good idea to ask students to begin their posts with the group they were assigned to (e.g. *Group 1*). In addition to

5 Question asked in the introductory session of my course "Intercultural and digital English worldwide" (TU Chemnitz, Winter Term 2022/23).

6 Question asked in my course "E-Learning: learning English with corpora and other tools" (TU Chemnitz, Summer Term 2023).

the advantages of collecting and visualizing results with the ARS tool already mentioned above, the ARS slide in this context also serves as the basis for the students' presentation of their results in the plenary. This kind of use also helps to save resources since it is no longer necessary for the lecturer to bring along posters, pens or other items for visualizing the results from group work.

### 3.4. Audience Response Systems for Checking Knowledge

Another area of application of Audience Response Systems is collecting formative feedback to see *what the students know and have remembered* about a topic (see e.g. Brewer, 2004, or Dufresne & Gerace, 2004, for individual applications or Kay & LeSage, 2009, for an overview). This form of feedback is beneficial for both the lecturers and the learners. It helps to find out whether the students have met the intended learning outcomes, whether they have understood certain concepts or whether there are aspects that should be re-explained or revisited in the course or individually outside of the classroom. As such, this type of ARS use bears a quiz character without negative consequences for the learners if they provide a wrong answer to a question.

Such formative assessment can be conducted at different stages of a course session. It could take place as a review at the beginning of a class to see what students have remembered from the last session or, especially in so-called flipped classroom scenarios (cf. Lage et al., 2000), what they remembered and understood from the preparation for the course. Likewise, it can take place at the end of a session or topic to see what students have taken away and whether the lecturer can move on to the next topic or should clarify some aspects again beforehand.

Many question types are suitable in this context, depending on what the assessment objective is and on what the chosen tool offers. Examples include *quizzes*, *polls*, *multiple choice*, *match pairs*, *putting items in the correct order,* or even *typing answers* in free text. The quiz type brings in an element of gamification (see e.g. Kapp, 2012) by awarding points not only for correct answers but also for speed and by including leaderboards. Such gamification elements can further enhance student motivation and foster participation by offering a playful type of competition among the class members.

## 4. Student Feedback on Using ARS in Class

I have implemented ARS regularly into my courses for over two semesters now. During this time, I collected feedback from the students on using ARS in class on various occasions and closely watched how they engaged with the ARS tool.

### 4.1. What Students Do

Generally, student participation with the ARS tool was high, usually ranging between 90 and 100%. This can be seen as an indicator that students have no issue engaging with ARS and using it in the classroom. Secondly, when using *AhaSlides*, students also make use of the expressive emoji function on the different slides voluntarily. For example, they

add hearts or smileys as reactions to introductory check-ins or other slides. This type of additional engagement and interaction can be interpreted as a sign of the students enjoying the use of ARS tools.

### 4.2. What Students Say

As part of an ongoing evaluation process, I regularly ask students for anonymous feedback in the form of so-called One-Minute Papers (cf. Angelo & Cross, 1993, pp. 148–153). In this context, I often ask the students to name three things that they liked about the course and that should be maintained as well as three things that could be improved in the future. The following is a summary of the most essential points that related specifically to the use of ARS in class.

**Positive aspects that should be maintained:**

- The ARS-supported check-ins are evaluated as very positive by almost all my students. Reasons given include that it helps students to better focus on the course and that it motivates them.
- Increased course interactivity through the diversified use of ARS and group work is often highlighted as a positive aspect and rated as motivating and conducive to learning.
- Gamification elements (e.g. ARS quizzes) are also considered motivating.
- Some students also stress the positive course atmosphere[7].

**Aspects that should be changed in the future:**

- So far, I have only once received the feedback that the ARS-based check-ins are unnecessary for the course.

The student feedback supports the perceptions outlined above. Students enjoy working with ARS and feel more actively engaged. They report that using ARS fosters their motivation and benefits their learning. Of course, the results now only refer to one cohort of students. It will be interesting to see how other cohorts (perhaps also in other courses or study programs) respond to the concept in the future.

## 5. Discussion

As outlined above, the students in my courses generally reported to have enjoyed using ARS tools in class and viewed it as positive and favorable for their learning. These findings are also in line with previous reports and studies on the use of ARS in higher education

7 Although not explicitly related to the use of ARS, I included this point as I am convinced that the perception of the learning atmosphere in class being positive is a result or the interactive and engaging course design as such.

(cf., e.g., Åhman et al., 2021; Gokbulut, 2020; Pichardo et al., 2012). ARS can thus offer a great way of actively engaging learners in class.

Nonetheless, teachers and lecturers planning to use ARS in their classrooms need to be aware of some disadvantages that the implementation of ARS might involve. First of all, they need to choose one of the many software options that exist and need to familiarize themselves with it. Some ARS tools will undoubtedly be more user-friendly than others, some require paid subscriptions, and others will offer specific features unavailable to other ARS tools. Secondly, the required ARS slides need to be prepared before class. While creating ARS slides on the spot is certainly possible, it will take a few moments, even for advanced users. Moreover, one has to keep in mind that the slides need to be made available to the students in class, be it via a QR code or link. Preparing the use of ARS in class beforehand will guarantee a smoother application and support lecturers who are new to using ARS. Another disadvantage is that students need to utilize their own devices. It is certainly beneficial that current online ARS tools are easily accessible for students, and in fact, this is one reason in favor of using them. However, it needs to be borne in mind that this means that students have to use their devices to engage with the questions. Finally, lecturers must check whether a tool complies with data protection regulations before using it in the classroom.

On the other hand, there are many positive aspects related to using ARS tools in class. First of all, ARS are readily available and can easily be integrated and implemented in the classroom. All it takes is a (relatively) stable internet connection, and students can join in and participate with their own devices. Since practically all students own a smartphone, this is easily possible. The lecturer only needs to share access to the ARS tool by displaying a QR code or providing a link or access code. This can happen either through a projection in class or even via the learning platform. Moreover, current ARS offer a high diversity in question types, which makes ARS very versatile in application. Example activities as the ones outlined above can easily be transferred and adapted to other teaching contexts and needs. In addition, using ARS in class offers the opportunity for a low-threshold activation of the students, including those that tend to be quieter in general. This helps to make lessons more inclusive for different student preferences and needs. Last but not least, implementing ARS tools in class is a resource-efficient way of collecting, displaying and storing results that were developed and presented in class. Most of the tools available allow the export of the results to different data formats, such as .xls files, PDF or images. These results can then easily be shared with the class, either by uploading them directly to the learning platform or by incorporating them into the course material.

## 6. Conclusion

The present paper has reported several ways of integrating ARS tools in class. They support a shift from passive to active learners by actively engaging students in class. Not only can ARS foster student participation, but they also help to sustain or enhance their motivation while contributing to a positive learning atmosphere in the classroom.

Overall, ARS tools can be used in a multitude of contexts in which they serve different purposes. For example, they can engage students and activate their prior knowledge on a

topic. Moreover, they can help to check in with students to see what they currently need and how their needs could be adapted to. ARS tools also serve to collect formative feedback, which is helpful for students and lecturers alike. They can give insights into what students have already understood and what aspects must be reconsidered or revised. This formative feedback can be collected through quizzes, which helps to further bring in the element of gamification. And finally, ARS tools not only allow to display students' answers in real-time, but they also help to save these answers and findings to make them available to the whole class afterwards. As such, ARS arguably enrich higher education teaching in many ways.

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